EJVES Extra **9**, 35–36 (2005)
doi:10.1016/j.ejvsextra.2005.01.011, available online at http://www.sciencedirect.com on SCIENCE DIRECT®

SHORT REPORT

Cephalic Vein for Carotid Patching

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Objective. *To assess the effectiveness of cephalic vein patch (CVP) closure following carotid endarterectomy (CEA).*
Material and methods. *We reviewed 121 patients who underwent CEA using CVP closure. Patch-rupture, re-exploration, false aneurysm formation, re-stenosis requiring surgery, 30-day-mortality, donor site complications, stroke and TIA were noted. A small cohort of patients was reviewed at 5 years and rescanned.*
Results. *No patient suffered patch rupture or re-stenosis requiring surgery. One patient developed false aneurysm at 1 year but at the time of repair the patch was found to be intact. There were two cardiac deaths. Three patients suffered strokes of whom two made a full recovery. There were three cases of TIA. All wrist wounds healed primarily without complications. None of the 10 patients recalled for scanning at 5 years showed re-stenosis or late aneurysmal dilatation at the site of surgery.*
Conclusion. *Cephalic-vein can be harvested at the wrist without donor site complications and our experience shows it to be a convenient and safe means of closure following CEA. Compared to prosthetics it is cheaper and less susceptible to bacterial contamination. The use of CVP preserves leg veins for future cardio-vascular interventions. Long term function of CVP appears satisfactory.*

Keywords: Cephalic vein; Carotid endarterectomy; CEA; Vein patching.

Following carotid endarterectomy patch closure of the arteriotomy has been claimed to reduce peri-operative neurological events and the incidence of late re-stenosis. However, a cochrane review[1] updated in 2004[2] demonstrates shortcomings in the body of supporting evidence. The choice of patch materials includes synthetic materials (PTFE, Dacron), processed homografts, xenografts (bovine vein patch) and autologous vein. No differences have been shown between the performance of these materials.[3–6]

Homografts and xenografts demand care with harvesting and storage and incur potential for transmission of infection. Synthetic patches are expensive and have been associated with an increase risk of infection and false aneurysm formation.[7] Suture hole bleeding can be a problem with PTFE.

Autologous patches are usually constructed from long saphenous vein but this may be unavailable or may be required for other forms of vascular reconstruction. LSV harvesting may incur donor site complications including infection, haematoma, neuropraxia and delayed healing. Patch rupture has been reported in up to 0.5% of LSV patches[5] although Archie et al. showed experimentally that the rupture pressure for veins of diameter ≥ 4 mm exceeds 300 mmHg.[8]

For over a decade, our preferred carotid endarterectomy patch material has been autologous—usually cephalic—vein harvested from the ipsilateral distal forearm.

Methods

We reviewed 121 consecutive patients who underwent carotid endarterectomy between 1992 and 2003 using a cephalic vein patch and recorded any post-operative complications. The harvested vein was split longitudinally, cut to length and sutured into the arteriotomy with the valves oriented in the direction of flow. All of the patients in this study underwent a carotid duplex scan after 6 weeks and all were

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followed for at least 6 months post-operatively. They were asked to report any later events. By a process of arbitrary selection we recalled 10 of 57 asymptomatic patients who had reached 5 years post-operative for repeat duplex scan.

Results

Mean age of the 121 patients was 67 years (range 45–84 years). Eighty-five patients were male. No patient suffered patch rupture. Early re-explorations for wound haematoma were required in six cases; in one a suture-hole bleed was over-sewn, in the other five the source of bleeding was unrelated to the vein patch. One patient developed false aneurysm at 1 year: on re-exploration the original vein patch was found to be intact and the sutures had cut out of the arterial wall. Repair with a further cephalic vein patch was successful.

Post-operative neurological complications were seen in six patients, resolving within 24 h in three. Only one patient suffered a persistent neurological deficit. One of the TIA patients demonstrated a hyper-perfusion syndrome with CT evidence of a small intra-ventricular bleed. Each of these six patients had an immediate duplex scan which showed no residual disease at the operation site, so no re-exploration was undertaken.

All wrist wounds healed primarily without any complications.

The duplex scans of the 10 patients recalled at 5 years after operation showed no significant re-stenosis and no evidence of aneurysmal dilatation at the carotid bifurcation.

Conclusion

We feel distal cephalic vein is suitable for use as a carotid patch, with ideal size, wall thickness and handling characteristics. It appears to be superior to long saphenous vein with respect to the incidence of donor site complications and its use preserves leg veins for future cardio-vascular interventions. Rupture and aneurysmal dilatation of cephalic vein patches was not encountered in this series at 6 months of follow-up and only one later complication was treated. There was no evidence of stenosis or dilatation in 10 patients who were recalled at 5 years.

Compared to prosthetics cephalic vein patch is cheaper and less susceptible to bacterial colonisation.

We conclude that cephalic vein patch is a satisfactory option for patch closure following carotid endarterectomy.

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Accepted 26 January 2005